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Author's Abstract

The peripheral nerve trunk that innervates the several muscles acting on the pectoral fin of S. spengleri, was completely transected in adult fish and the frayed ends were roughly apposed. Although 3 separate muscles were paralyzed, two of which are directly antagonistic in action, and all 3 of which have numerous functional subdivisions that work differentially, the normal coordinated beat of the fin rays was restored in orderly fashion when the nerve regenerated. Selective outgrowth of the regenerating fibers to their original motor endings was disfavored by the evidence as was also readaptation of the nerve centers on a functional basis. Myotypic respecification of the regenerated axons, such as occurs in urodele larvae, followed by synaptic reorganization in the spinal centers on a chemoaffinity basis is considered the most probable interpretation.